

Launch Weather Decision Support System, Phase I

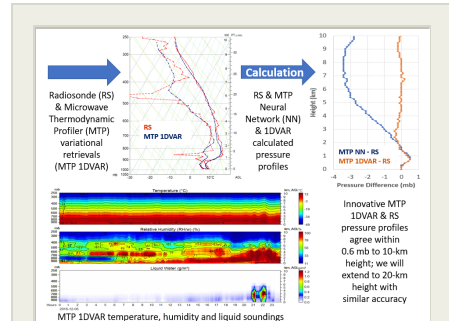
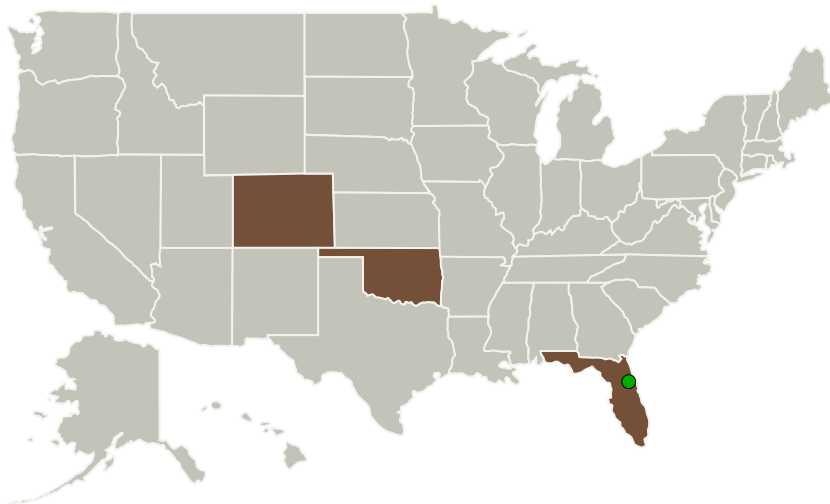
Completed Technology Project (2017 - 2018)



Project Introduction

Launch safety and efficiency requires timely and accurate wind, thermodynamic and pressure information from the surface to 20 km height, and lightning risk identification. A Doppler radar now provides wind measurements that satisfy this requirement at the Eastern Test Range. Thermodynamic soundings are provided by intermittent radiosondes on launch day. Typical intervals of an hour or more between radiosonde launches and drift distances of 100 km or more at 20 km height limit their timeliness and accuracy in characterizing the atmosphere along the launch path. NASA is seeking a thermodynamic remote sensing system with higher timeliness and accuracy, in clear and cloudy conditions. Current Radiometrics (RDX) microwave radiometer profilers provide continuous thermodynamic profiles from the surface to 10 km height, with radiosonde equivalent accuracy up to several km height, with decreasing accuracy at higher levels. The RDX profiler also provides cloud and atmospheric stability information that can be used to identify lightning risk. Improved thermodynamic profiler accuracy, and pressure profiling capability, have been demonstrated using variational retrieval methods that include model gridded analysis. Variational retrievals can also extend accurate thermodynamic and pressure profiling to 20 km height. We propose to implement and automate variational retrieval and lightning risk identification methods in a Launch Weather Decision Support System. The LWDSS will provide timely and accurate thermodynamic, pressure and lightning risk information needed to improve launch and airport safety and efficiency.

Primary U.S. Work Locations and Key Partners



Launch Weather Decision Support System, Phase I Briefing Chart Image

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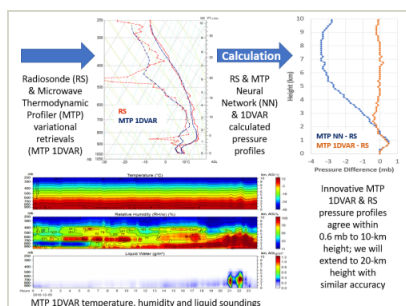


Organizations Performing Work	Role	Type	Location
Radiometrics Corporation	Lead Organization	Industry	Boulder, Colorado
● Kennedy Space Center(KSC)	Supporting Organization	NASA Center	Kennedy Space Center, Florida
University of Oklahoma-Norman Campus	Supporting Organization	Academia Alaska Native and Native Hawaiian Serving Institutions (ANNH)	Norman, Oklahoma

Primary U.S. Work Locations

Colorado	Florida
Oklahoma	

Images



Briefing Chart Image

Launch Weather Decision Support System, Phase I Briefing Chart Image

(<https://techport.nasa.gov/image/134743>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Radiometrics Corporation

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

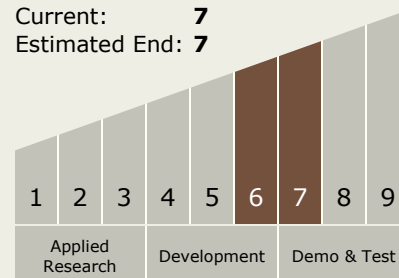
Carlos Torrez

Principal Investigator:

Randolph Ware

Technology Maturity (TRL)

Start: 6
Current: 7
Estimated End: 7



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Technology Areas

Primary:

- TX13 Ground, Test, and Surface Systems
 - └ TX13.1 Infrastructure Optimization
 - └ TX13.1.1 Natural and Induced Environment Characterization and Mitigation

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System